

## Chapter 21

### Tank design and aquascaping for live coral exhibits

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#### ABSTRACT

The aquarium community is littered with exhibits that are often ill-conceived and poorly executed. This paper will discuss some of the common mistakes made when designing aquarium exhibits and interior décor, such as visible plumbing lines, and offers suggestions on how to avoid them. Furthermore, while 2-D drawings may be fine for most design projects, when it comes to the aquarium design process they lack the visual stimulation and accuracy of 3-D models and illustrations. Only through the use of 3-D representations, can one fully appreciate the subtle nuances of exhibit design and discover design flaws. Such models can also be used as aids in construction and fund raising efforts.

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#### WINDOWS INTO A NEW WORLD

More than one aquarium curator has been overheard to say they considered aquascaping as irrelevant, “people just want to see the fish and coral.” But this may be a somewhat ill informed view and a patronising attitude towards the visitor.

Let us look at the philosophy of aquatic exhibit design. The first question that should be asked is “why have an exhibit at all?”. Many aquarists see exhibits with a museum mentality – rows of shelves with regimentally placed specimens in taxonomic order. But this is far removed from natural context and it is unlikely to excite the average visitor or, more importantly, educate that person as to the complexities of reef ecology and their plight in this age of pollution, climate change and habitat destruction.

Exhibits have the most value when they are literally “windows into a new world”, an intimate glimpse into a fascinating exotic environment with all its wondrous shapes, nooks and crannies that engage the visitor and compels interest in the subject. But to achieve this, the visitor needs to “believe”, or more accurately, their disbelief needs to be suspended to make this microcosm of nature believable.

By definition exhibits are something to look at,

an optical encounter, an illusion of wilderness, in short, a visual experience. The key to making this a successful experience and a convincing replication of a natural reef is the sum of several factors, some technical and some creative.

#### AN ILLUSTRATION IN 3-D

Rather like a picture or photograph in a book an exhibit is really an illustration, albeit in 3-dimensions, to your visitor audience.

And like any good illustration it should follow the conventions of viewing. Far from being “arty” nonsense it is a proven fact that certain compositions are more visually pleasing and easily assimilated by the human eye. The artists “rule-of-thirds” is as relevant to aquarium tanks as it is to underwater photographers. In this compositional convention, the main dominant feature of the exhibit should be placed one third to the left or right of the view and along a plane one third from the top or bottom of the view. Placing the focus in the centre will most certainly create an over-dominant aspect, which will negate any other visual interest in the tank. On the other hand, place the focus too far to the lateral extremities and it loses significance. When dealing with multiple focal points, one can also use the rule of thirds to draw a 3-D

grid within the exhibit space where the space is divided in the X, Y and Z planes into thirds. The points where the lines cross each other are the regions where the main focal points can be placed as these intersection points represent those areas where the eye is naturally drawn. One can also utilize a series of intersecting diagonal lines, again the points where these lines intersect will draw the viewer's eye.

Depth-of-field is another consideration. If you have the luxury of a wide tank, create features that expose other reef-forms behind, or through holes, producing the feeling of a wide expanse of open water.

Even with very narrow tanks the illusion of space can be achieved with shade. Overhangs cast shadows that may look like dark holes of apparent unknown depth.

## REEF SINS

There are a number of elements which can destroy the illusion of a natural aquascape and any one of these may ruin an otherwise convincing replica of a reef. It seems strange that many dedicated aquarists put so much effort and expense in recreating a natural marine feature in great detail but think nothing of leaving something unnatural exposed that could so easily have been hidden with a small degree of forethought.

Here are a few of the most common reef tank sins:

- Visible life support system (LSS) plumbing. With a well-planned exhibit, water piping, outlets, drains and surface skimmers can be hidden within the base rockwork or brought through the tank walls in unobtrusive locations.
- Exposed rockwork/live-rock edges. This is particularly obvious in smaller and medium tanks. When one can see where the reef work joins the wall of the tank, or worse still when your visitor can look down the length of a side wall with the thin layer of rockwork clearly visible. This is easily avoided by having no visible wall and more importantly having adequate space off to the sides of the view window so that the thickness of the rockwork can be accommodated. It may reduce the view window coverage, but the pay-off is worth it.
- Clearly visible backgrounds/walls. In some displays it may be desirable to leave the tank wall or part of it a neutral blue colour to represent 'open water beyond.' Be aware that in small tanks the illusion will be very difficult to achieve, algae, corallines, even the play of light, will all ruin the effect. The most noticeable give-away is as noted earlier, where one can see the edge where the rock joins the wall. Ensuring a 'return edge,' where the rockwork transition is behind an outcropping, can reduce this unattractive effect. Better still, in small tanks do not be afraid of making the entire tank solid reef. Where tank walls will be unavoidably be left exposed, specify that all corners be rounded. Even a slight radius will soften the harsh line caused by light falling on different angled planes.
- Cross viewing. Other people, rockwork/ wall edges and plumbing are all potential unnatural features when the visitor can see across a tank from more than one viewpoint. Ensure the integrity of uncompromised sightlines from all viewpoints; construct reef work outcrops to mask the opposite views. Although some may argue that people often like to look at other people through aquariums, in the author's opinion this serves only to shatter the illusion you have worked so hard to recreate, detracting from the exhibit and its contents and should be avoided.
- The "dreaded" architect. Though this may seem harsh to some, never, ever (if you can avoid it!) let an architect design an actual tank; in the author's opinion, the Aquarium world is littered with failed, inappropriate and unattractive tanks that were the brainchild of these most rigid of thinkers! Ensure you have a decisive role in the layout process, and be insistent that your concept is adhered to. Do not be bullied into squeezing your tank into too small or awkward a space, remember that as architects, their job is to make a shell that works for your exhibits, not to cram

them into the building of their dreams! Unfortunately, this is all too common in the public aquarium design world.

### DESIGN PROCESS

Think 3-D. It's a three dimensional, amorphous and organic mass you are creating and with so many other factors such as water movement, lighting angles etc, why would you want to rely on poorly detailed two-dimensional drawings?

Scale models are the solution, and assist in so many ways that a drawing simply cannot (at least not reliably). Furthermore, many people have great trouble envisioning a three dimensional design from a two dimensional drawing. Astonishingly, aquarium designers often see models as an unnecessary extravagance, possibly the reason why there are so many poorly conceived exhibits. Even simple models in card and sculpted clay, can enable you to develop and fully visualize concepts that can

be quickly modified to suit your requirements. Sightlines can be envisaged and concealed positions found for LSS plumbing. Viable space for placing coral, lighting configurations, water current/circulation, possible detritus traps can all be assessed.

Since they are volumetric, models enable fairly accurate assessments of required materials such as live-rock and sand substrate quantities or facilitate costs from artificial rockwork contractors. Not only do they ultimately provide an essential 3-D reference during the construction phase, they can also be used as very effective visual tools in funding raising campaigns.

In conclusion, the well-planned and carefully visualized tanks are generally the most successful. Plan ahead, develop your concept and flesh it out in 3 dimensions, if it doesn't work, develop the idea, and do not be afraid of starting again. Like the well-planned illustration, the concept and implementation are vital.

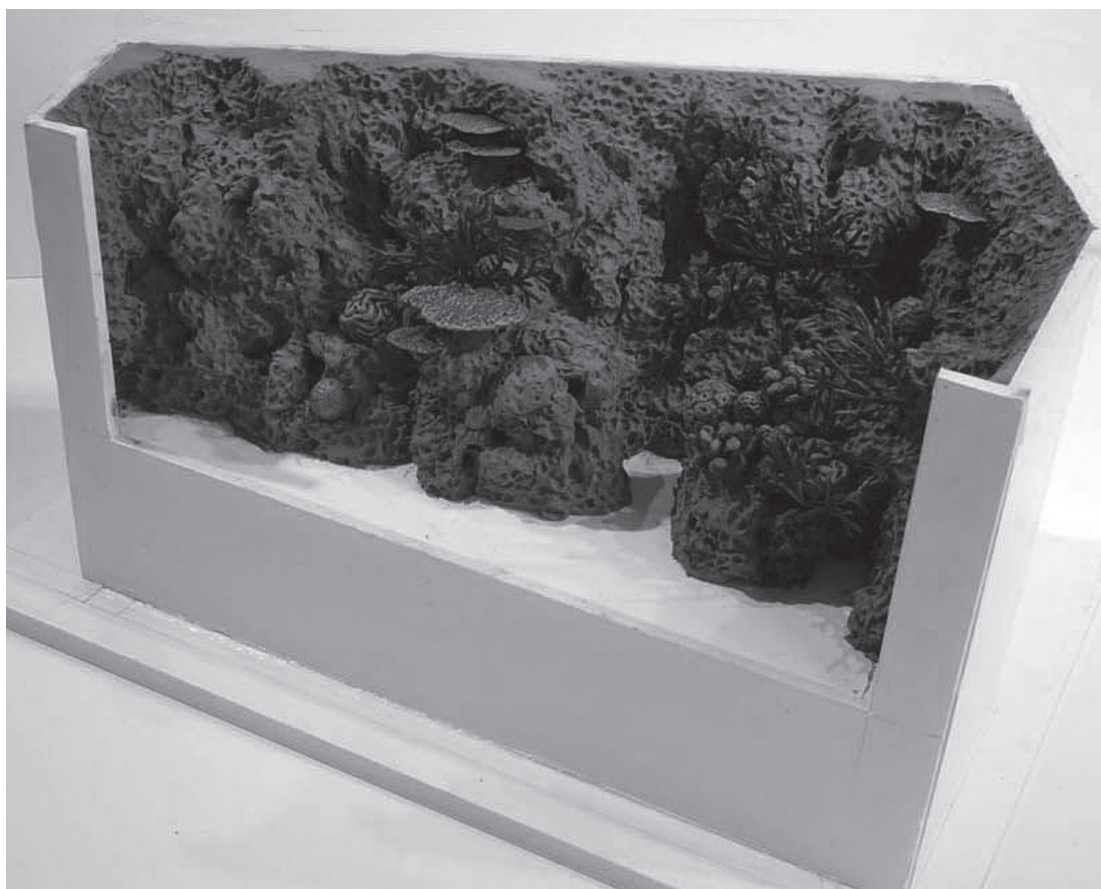


Figure 1: Lazenby model 1



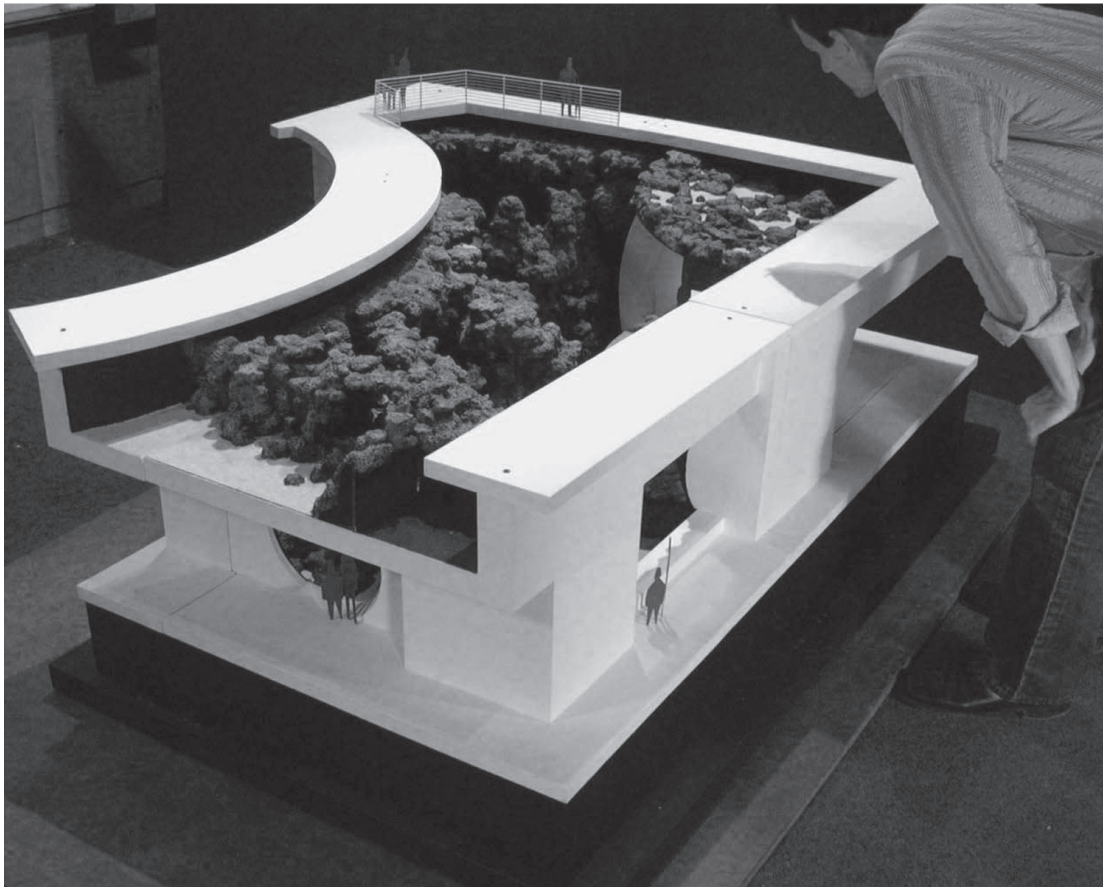


Figure 2: Lazenby model 2



Figure 3: Lazenby model 3